

LONG-TERM TIME SERIES AND AEROSOL DISTRIBUTION OF BERYLLIUM-7 IN THE ATMOSPHERIC ENVIRONMENT

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In the framework of the federal monitoring programme of the environment and food stuffs radioactivity in air has been measured for many years. High volume aerosol samplers at different locations in Austria collect aerosols on filter material. After a sampling period of one week the filters are measured routinely with high resolution gamma spectrometry. One sampler is located at a high-altitude Alpine station at 3105m. The sampling period at this station is one day which gives a much better time resolution for the Be-7 activity concentration in air. In addition, a high volume cascade impactor with six impactor stages (Dp,50 cut-points at > 10.2 µm, 4.2 - 10.2 µm, 2.1 - 4.2 µm, 1.3 - 2.1 µm, 0.69 - 1.3 µm, 0.39 - 0.69 µm, and < 0.39 µm) is in operation at the location in Linz.

The cosmogenic radionuclide Be-7 is formed through spallation reactions with decreasing production rates with atmospheric depth. Although about two thirds of the Be-7 production takes place in the stratosphere and one third in the troposphere (mainly in the upper troposphere), due to stratosphere-to-troposphere exchange (STE) Be-7 is also present in the near-to-ground atmosphere.

This paper presents long-term time series of Be-7 both at the ground stations and the high-altitude Alpine station. Although the Be-7 activity concentrations are highly episodic, certain time variations can be observed like the 11-years cycle of solar activity and the annual cycle.

Furthermore, the results of the aerosol size distribution and their seasonal variation will be given.

The factors controlling the Be-7 activity concentration will be discussed.